Search Report
EIC 2800

STIC Scientific & Technical Information Center

STIC Database Tracking Number: 267226

To: BROOKE PURINTON
Location: JEF-0B13
Art Unit: 2881
Friday, July 25, 2008

Case Serial Number: 10/567,904

From: SCOTT SEGAL
Location: EIC2800
JEF-4C59
Phone: (571)272-1314

scott.segal@uspto.gov

Search Notes

Re: Probe for Probe Microscope Using Transparent Substrate, Method of Producing the Same, and Probe Microscope Device

Examiner Purinton:

Attached are edited search results from the patent and NPL literature in STN. Databases searched included Chemical Abstracts, Derwent World Patent Index, Japan Patent Abstracts, and Korean Patent Abstracts. In addition, I examined the search reports for the foreign patent family members, and forward citation searched these documents. Unfortunately, I do not believe I found the limitations of Claim 2, or of Fig 10. Here are some results which may be of some use.

If you would like more searching to be done on this case (re-focused), or if you have questions or comments, please do not hesitate to contact me.

Respectfully,
Scott

Scott Segal
Searcher, STIC-EIC2800
JEF-4C59, 571-272-1314

VOLUNTARY SEARCH FEEDBACK

STIC
Scientific & Technical Information Center

Art Unit ______________ App./Serial # ______________

Relevant prior art found

- [ ] 102 rejection
- [ ] 103 rejection
- [ ] Cited as being of interest
- [ ] Helped better understand invention
- [ ] Helped better understand state of the art in technology

Types [ ] Foreign Patent(s) [ ] Non-Patent Literature

Relevant prior art not found

- [ ] Results verified the lack of relevant prior art (helped determine patentability).
- [ ] Results were not useful in determining the patentability or understanding of the invention.

COMMENTS (click below to type)

Questions about the scope or the results of the search?
Contact your EIC searcher or EIC Supervisor.
Please submit completed form to your EIC

12/07

STIC USE ONLY

Today's Date ______________

Additional Notes if applicable (please indicate all actions including emails, phone calls, and individuals assisting):

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267226

STIC
Scientific & Technical Information Center

EIC 2800
SEARCH REQUEST

Today's Date JUL 23 2008

Name Brooke Purinton

AU/Org. 2881 Employee # 85090

Bld.&Rm.# Jef. 0B13 Phone 0-5384

Priority App. Filing Date 8-11-2003

Case/App. # 10/567904

Format for Search Results

EMAIL ✓ PAPER __

If this is an Appeals case, check here ☐

Describe this invention in your own words

Synonyms

Additional Comments

* Please see the search topic as described in the attached search request submitted by the Examiner.

Please submit completed form to your EIC.

STIC USE ONLY

Searcher Scott Segal

Date Completed 7/25/08

Phone 2-1314

Sources Chemical Abstracts, Derwent World Patent Index, Japan Patent Abstracts, Europ. Pat Abs

JUL 2 3 2008

267226

.kson, Diane

From: BROOKE PURINTON [brooke.purinton@uspto.gov]
Sent: Wednesday, July 23, 2008 10:59 AM
To: STIC-EIC2800
Cc: NPL Feedback
Subject: Search Request, Case/Application No.: 10567904

Requester: **BROOKE PURINTON (P/2881)**
Art Unit: **GROUP ART UNIT 2881**
Employee Number: **85090**
Office Location: **JEF 0B13**
Phone Number: **(571)270-5384**

Case/Application number: **10567904**
Priority Filing Date: **8/11//2003**
Format for Search Results: **Email**
Is this a Board of Appeals case? **No, this is not a Board of Appeals case.**
Describe this invention in your own words:
a probe for a probe microscope which is made on a transparent susbtrate and has a microlens in the substrate, see claim 2 or figure 10 for the idea needed. 302 is the microlens, 301 is the transparent substrate of the probe, 304 is the cantilever that is closest to the sample surface.

Synonyms:

Additional comments:

Attachment: **No**

Figure 9

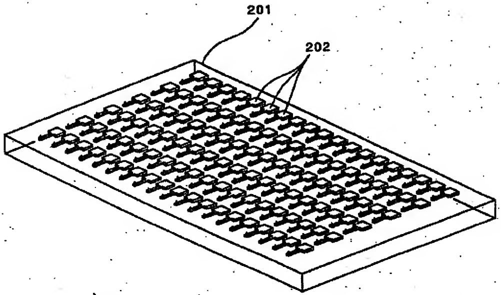
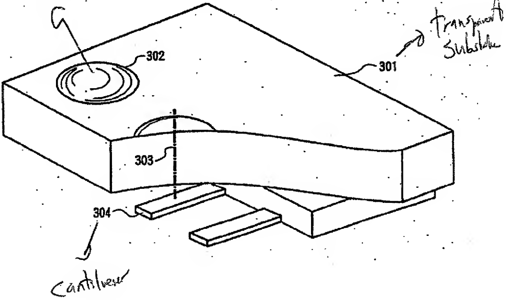


Figure 10 microlens



177] When the probe described in Embodiment 2 is ed, the optical lens 2113 may not be necessary in some ses. When the probe described in Embodiment 4 is used, e quarter-wave plate 2118 is not necessary.

178] An intensity modulation frequency of the excitaon laser light is determined by the frequency of an excitation frequency signal generator 2117. By setting the frequency to coincide with the resonant frequency of the antilever 2107 at a certain point, the amplitude of the ibration is decreased as the resonant frequency of the antilever 2107 is changed, and the change in resonant requency is obtained. In addition, instead of the excitation requency signal generator 2117, by using an output signal of the laser Doppler velocimeter 2115 being amplified and passed through a filter, self-excited vibration may be allowed to occur, and by detecting the change in this vibration frequency, the change in resonant frequency can also be detected.

[0179] In the embodiment described above, the probe microscope device is described by way of example in which the method for vibrating the cantilever by blinking light is performed in combination with the laser Doppler velocimeter. Alternatively, a probe microscope device may also be formed in which the method for vibrating the cantilever by blinking light is combined with an optical lever or the method described in Embodiment 9.

Embodiment 11

[0180] Next, a method for driving a cantilever of a probe microscope device of Embodiment 11 according to the present invention will be described.

[0181] As shown in FIG. 29, on a substrate 2201, a thin film structure (cantilever) 2202 is provided parallel to this substrate 2201. When laser light 2204 is irradiated from the above, the thin film structure (cantilever) 2202 absorbs part of the light. The rest of the light passes through the thin film structure 2202 and reaches the surface of the substrate 2201. A space between the thin film structure 2202 and the substrate 2201 forms the structure similar to one type of Fabry-Perot resonator, and a standing light wave 2203 is generated.

[0182] The amount of energy absorbed from light in the thin film 2202 is proportional to the amplitude of the standing wave 2203. When the amount of light absorbed in the thin film 2202 at the top side is different from that at the bottom side, a bending moment is generated, so that the thin film is bent; however, since the standing wave 2203 is present, as a result of the above bending, the amount of absorption of light is also changed. It has been known that when the amplitude and the position of the standing wave 2203 satisfy appropriate conditions, self-excited vibration occurs in the thin film structure 2202. This phenomenon is disclosed in Non-Patent Document 2 described above.

[0183] Since the probe of the present invention uses the transparent substrate, laser light 2205 is allowed to pass through the transparent substrate from the lower side shown in FIG. 29, and self-excited vibration similar to that described above can be generated.

[0184] An embodiment of a probe microscope device in which self-excited vibration is generated in a cantilever using this phenomenon can be achieved with, for example, exactly the same device as in the embodiment shown in FIG. 23, and by appropriately adjusting the intensity and the wavelength of the laser light source 1615 and the space between the cantilever 1607 and the transparent substrate. Alternatively, it can be achieved with an embodiment approximately equivalent to that shown in FIG. 28, additionally changing the excitation laser light source 2116 to a laser light source having a constant intensity, and adjusting the intensity and the wavelength thereof and the space between the cantilever 2107 and the substrate appropriately. An optical lever may also be used in combination.

[0185] The present invention is not limited to the embodiments described above, and within the spirit and the scope of the present invention, various modification may be performed and are not excluded from the range of the present invention.

INDUSTRIAL APPLICABILITY

[0186] The present invention may be suitably applied to a probe microscope having a probe with high accuracy.

1. A probe for a probe microscope using a transparent substrate, comprising: at least one cantilever which is made of a thin film and which is supported on one surface of the transparent substrate with a predetermined space therefrom, the transparent substrate being formed of a material transparent to visible light or near-infrared light and having an observation window function which enables optical observation and measurement while partitioning environments of the inside and the outside of a container, whereby the cantilever is optically observed or measured or is optically driven through the rear surface of the transparent substrate.

2. The probe for a probe microscope using a transparent substrate, according to claim 1, wherein a microlens is formed as a part of the transparent substrate, the microlens allows light used for optical observation or measurement of the cantilever, or for optical driving thereof to converge on the rear surface of the cantilever.

3. The probe for a probe microscope using a transparent substrate, according to claim 1, wherein the front surface of the transparent substrate is slightly inclined to the rear surface thereof in order to prevent the interference between a light reflected on the front surface of the transparent substrate and a light reflected on the rear surface thereof.

4. The probe for a probe microscope using a transparent substrate, according to claim 1, wherein the transparent substrate is also used as a quarter-wave plate.

5. The probe for a probe microscope using a transparent substrate, according to claim 1, wherein the cantilever has an internal stress, whereby the space between the cantilever and the transparent substrate is gradually increased from a fixed portion of the cantilever toward the free end thereof.

6. A method for manufacturing a probe for a probe microscope using a transparent substrate, comprising the steps of

(a) forming a cantilever from a single crystalline silicon thin film of a SOI substrate;

(b) bonding the rear surface of the SOI substrate to a glass substrate; and

(c) removing a handling wafer and a buried oxide film of the SOI substrate.

Search Histories

13:01:33 ON 25 JUL 2008
15:10:06 ON 25 JUL 2008

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FILE 'HCAPLUS, WPIX, JAPIO, KOREAPAT' ENTERED AT 13:01:50 ON 25 JUL 2008
L1        711234 SEA ABB=ON  PLU=ON  (TRANSPAREN### OR TRANSLUCEN? OR GLASS###
                 OR LUCENT OR CLEAR OR SEE THROUGH OR LUCID OR SEMITRANSPARENT
                 OR (NON OR "NOT")(W)(OPAQUE) OR NONOPAQUE?)(2A)(SUBSTRATE OR
                 ?LAYER? OR ?COAT? OR ?FILM? OR ?SURFACE? OR LAMEL? OR ?LAMINAT?
                  OR OVERLAY? OR PLATE OR SHEATH###)
L2        154393 SEA ABB=ON  PLU=ON  (TRANSPAREN### OR TRANSLUCEN? OR GLASS###
                 OR LUCENT OR CLEAR OR SEE THROUGH OR LUCID OR SEMITRANSPARENT
                 OR (NON OR "NOT")(W)(OPAQUE) OR NONOPAQUE?)(2A)(OVERLAID OR
                 SHEET#### OR ?DEPOSIT? OR FOIL OR OVERSPREAD? OR UNDERLY####
                 OR OVERLY#### OR OVERLIE# OR UNDERLIE# OR COVER?)
L3           923 SEA ABB=ON  PLU=ON  (L1 OR L2) AND ?CANTILEVER?
L4             0 SEA ABB=ON  PLU=ON  L3 AND (MICROLENS### OR MICRO LENS? OR
                 NANOLENS? OR NANO LENS? OR LENS###)(4A)(TRANSPAREN### OR
                 TRANSLUCEN? OR GLASS### OR LUCENT OR CLEAR OR SEE THROUGH OR
                 LUCID OR SEMITRANSPARENT OR (NON OR "NOT")(W)(OPAQUE) OR NONOPAQUE?)
L5             2 SEA ABB=ON  PLU=ON  L3 AND (MICROLENS### OR MICRO LENS? OR
                 NANOLENS? OR NANO LENS? OR LENS###)(3A)(SUBSTRATE OR ?LAYER?
                 OR ?COAT? OR ?FILM? OR ?SURFACE? OR LAMEL? OR ?LAMINAT? OR
                 OVERLAY? OR PLATE OR SHEATH###)
L6             0 SEA ABB=ON  PLU=ON  L3 AND (MICROLENS### OR MICRO LENS? OR
                 NANOLENS? OR NANO LENS? OR LENS###)(3A)(OVERLAID OR SHEET####
                 OR ?DEPOSIT? OR FOIL OR OVERSPREAD? OR UNDERLY#### OR OVERLY###
                 # OR OVERLIE# OR UNDERLIE# OR COVER?)
L7            84 SEA ABB=ON  PLU=ON  ((L1 OR L2)) AND (?CANTILEVER?)(3A)(PLURAL#
                 ## OR AT LEAST OR MORE THAN ONE OR MULTIPLE OR MULTIPLIC######
                 OR MULTI OR MYRIAD OR MULTITUDE## OR 2ND OR 3RD OR SECOND OR
                 THIRD OR NUMEROUS OR LARGE NUMBER OR GREAT NUMBER OR MANY OR
                 SEVERAL OR TWO OR THREE OR GREATER THAN OR ?ARRAY? OR SET)
L8           240 SEA ABB=ON  PLU=ON  ((L1 OR L2)) AND (?CANTILEVER?)(3A)(SUBSTRA
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                 ?LAMINAT? OR OVERLAY? OR PLATE OR SHEATH#### OR OVERLAID OR
                 SHEET#### OR ?DEPOSIT? OR FOIL OR OVERSPREAD? OR UNDERLY####
                 OR OVERLY#### OR OVERLIE# OR UNDERLIE# OR COVER?)
L9             0 SEA ABB=ON  PLU=ON  L3 AND (MICROLENS### OR MICRO LENS?)
L10           14 SEA ABB=ON  PLU=ON  L3 AND (LENS###)
L11          217 SEA ABB=ON  PLU=ON  L3 AND (AT##(1W) FORCE MICROSCOP### OR
                 ATOMIC FORCE MICROSCOP? OR SCANNING(1W) MICROSCOP? OR FORCE(W)
                 MICROSCOP? OR ELECTRON(W) MICROSCOP? OR SFM OR AFM OR TRANSMISS
                 ION(1W) MICROSCOP? OR PROBE(1W) MICROSCOP? OR TUNNEL#####(1W)MICROSCOP?)
L12            3 SEA ABB=ON  PLU=ON  L3 AND STM
L13           22 SEA ABB=ON  PLU=ON  L3 AND (V05-F01A5 OR V05-F04B6A)/MC
L14           18 SEA ABB=ON  PLU=ON  L3 AND (G12B21-08 OR G12B21-02 OR G12B21-22)/IPC,IC
L15           48 SEA ABB=ON  PLU=ON  L3 AND (G01N13-16 OR G01N13-10)/IPC,IC
L16           19 SEA ABB=ON  PLU=ON  L3 AND (OPTIC#######)(2A)(OBSERV########
                 OR MEASUR########### OR DRIV#### OR VIEW##### OR INVESTIGAT?
                 OR ANALYSIS OR ANALYS###### OR ANALYZ####### OR INSPECT#### OR EXAM########)
L17           14 SEA ABB=ON  PLU=ON  L3 AND (OBSERV####### OR VIEW#### OR
                 WATCH#####)(2A)(WINDOW OR LENS### OR MICROLENS#### OR GLASS###)
L18           21 SEA ABB=ON  PLU=ON  L3 AND (S03-E02F)/MC
L19          135 SEA ABB=ON  PLU=ON  L3 AND (?CANTILEVER?)(3A)(TEST#### OR
                 OBSERV######## OR MEASUR########### OR DETECT##### OR DETERMIN#
                 ##### OR GUAG### OR GAGE# OR GAGING OR QUANTIFY#### OR
                 QUANTIF######## OR EXAMIN##### OR VIEW##### OR WATCH#### OR
                 (LIGHT OR IRRAD? OR RADIAT?)(1W)(REFLECT?))
L20          124 SEA ABB=ON  PLU=ON  L3 AND (?CANTILEVER?)(4A)(DEFORM? OR
                 VIBRAT###### OR BEND#### OR ELONGAT#### OR STRAIN### OR
                 STRESS#### OR EXPANS#### OR SHEAR### OR TORSION? OR FLEXIB#####
                 ## OR FRIABIL? OR STRETCH##### OR RESONANCE OR OSCILATT? OR PULSAT#####)
L21            0 SEA ABB=ON  PLU=ON  L3 AND (?CANTILEVER? OR ?PROBE?)(3A)(REAR##
                 ###### OR BACK##### OR POSTERIOR? OR OPPPOS#### OR BEHIND)(2A)(
                 SUBSTRATE OR ?LAYER? OR ?COAT? OR ?FILM? OR ?SURFACE? OR
                 LAMEL? OR ?LAMINAT? OR OVERLAY? OR PLATE OR SHEATH#### OR OVERLAID)
L22            0 SEA ABB=ON  PLU=ON  L3 AND (?CANTILEVER? OR ?PROBE?)(3A)(REAR##
                 ###### OR BACK##### OR POSTERIOR? OR OPPPOS#### OR BEHIND)(2A)(
                 SHEET#### OR ?DEPOSIT? OR FOIL OR OVERSPREAD? OR UNDERLY####
                 OR OVERLY#### OR OVERLIE# OR UNDERLIE# OR COVER?)
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L23         7217 SEA ABB=ON  PLU=ON  (L1 OR L2) AND (?PROBE?)
L24           16 SEA ABB=ON  PLU=ON  L23 AND (MICROLENS? OR MICRO LENS?)
L25          256 SEA ABB=ON  PLU=ON  L23 AND LENS####
L26         7217 SEA ABB=ON  PLU=ON  (L23 OR L24 OR L25)
L27           65 SEA ABB=ON  PLU=ON  L26 AND (S03-E02F)/MC
L28          174 SEA ABB=ON  PLU=ON  L26 AND (G01N13-16 OR G01N13-10)/IPC,IC
L29          381 SEA ABB=ON  PLU=ON  L26 AND (OPTIC#######)(2A)(OBSERV########
                 OR MEASUR########### OR DRIV#### OR VIEW##### OR INVESTIGAT?
                 OR ANALYSIS OR ANALYS###### OR ANALYZ####### OR INSPECT#### OR EXAM########)
L30           73 SEA ABB=ON  PLU=ON  L26 AND (OBSERV####### OR VIEW#### OR
                 WATCH#####)(2A)(WINDOW OR LENS### OR MICROLENS#### OR GLASS###)
L31          960 SEA ABB=ON  PLU=ON  L26 AND (?PROBE?)(3A)(PLURAL### OR AT
                 LEAST OR MORE THAN ONE OR MULTIPLE OR MULTIPLIC###### OR MULTI
                 OR MYRIAD OR MULTITUDE## OR 2ND OR 3RD OR SECOND OR THIRD OR
                 NUMEROUS OR LARGE NUMBER OR GREAT NUMBER OR MANY OR SEVERAL OR
                 TWO OR THREE OR GREATER THAN OR ?ARRAY? OR SET)
L32          992 SEA ABB=ON  PLU=ON  L26 AND (AT##(1W) FORCE MICROSCOP### OR
                 ATOMIC FORCE MICROSCOP? OR SCANNING(1W) MICROSCOP? OR FORCE(W)
                 MICROSCOP? OR ELECTRON(W) MICROSCOP? OR SFM OR AFM OR TRANSMISS
                 ION(1W) MICROSCOP? OR PROBE(1W) MICROSCOP? OR TUNNEL#####(1W)MICROSCOP?)
L33           58 SEA ABB=ON  PLU=ON  L26 AND (V05-F01A5 OR V05-F04B6A)/MC
L34           40 SEA ABB=ON  PLU=ON  L26 AND (G12B21-08 OR G12B21-02 OR G12B21-22)/IPC,IC
L35          174 SEA ABB=ON  PLU=ON  L26 AND (G01N13-16 OR G01N13-10)/IPC,IC
L36          381 SEA ABB=ON  PLU=ON  L26 AND (OPTIC#######)(2A)(OBSERV########
                 OR MEASUR########### OR DRIV#### OR VIEW##### OR INVESTIGAT?
                 OR ANALYSIS OR ANALYS###### OR ANALYZ####### OR INSPECT#### OR EXAM########)
L37           73 SEA ABB=ON  PLU=ON  L26 AND (OBSERV####### OR VIEW#### OR
                 WATCH#####)(2A)(WINDOW OR LENS### OR MICROLENS#### OR GLASS###)
L38           65 SEA ABB=ON  PLU=ON  L26 AND (S03-E02F)/MC
L39          105 SEA ABB=ON  PLU=ON  L11 AND L23
L40            1 SEA ABB=ON  PLU=ON  L11 AND L25
L41          228 SEA ABB=ON  PLU=ON  (L11 OR L12 OR L13 OR L14 OR L15)
L42            0 SEA ABB=ON  PLU=ON  L41 AND MICROLENS?
L43            4 SEA ABB=ON  PLU=ON  L41 AND LENS###
L44          616 SEA ABB=ON  PLU=ON  (L34 OR L35 OR L36 OR L37 OR L38)
L45           10 SEA ABB=ON  PLU=ON  L44 AND (?CANTILEVER?)(3A)(TEST#### OR
                 OBSERV######## OR MEASUR########### OR DETECT##### OR DETERMIN#
                 ##### OR GUAG### OR GAGE# OR GAGING OR QUANTIFY#### OR
                 QUANTIF######## OR EXAMIN##### OR VIEW##### OR WATCH#### OR
                 (LIGHT OR IRRAD? OR RADIAT?)(1W)(REFLECT?))
L46           10 SEA ABB=ON  PLU=ON  L44 AND (?CANTILEVER?)(4A)(DEFORM? OR
                 VIBRAT###### OR BEND#### OR ELONGAT#### OR STRAIN### OR
                 STRESS#### OR EXPANS#### OR SHEAR### OR TORSION? OR FLEXIB#####
                 ## OR FRIABIL? OR STRETCH##### OR RESONANCE OR OSCILATT? OR PULSAT#####)
L47            0 SEA ABB=ON  PLU=ON  L44 AND (?CANTILEVER? OR ?PROBE?)(3A)(REAR#
                 ####### OR BACK##### OR POSTERIOR? OR OPPPOS#### OR BEHIND)(2A)
                 (SUBSTRATE OR ?LAYER? OR ?COAT? OR ?FILM? OR ?SURFACE? OR
                 LAMEL? OR ?LAMINAT? OR OVERLAY? OR PLATE OR SHEATH#### OR OVERLAID)
L48            1 SEA ABB=ON  PLU=ON  L44 AND (?CANTILEVER? OR ?PROBE?)(3A)(REAR#
                 ####### OR BACK##### OR POSTERIOR? OR OPPPOS#### OR BEHIND)(2A)
                 (SHEET#### OR ?DEPOSIT? OR FOIL OR OVERSPREAD? OR UNDERLY####
                 OR OVERLY#### OR OVERLIE# OR UNDERLIE# OR COVER?)
L49            2 SEA ABB=ON  PLU=ON  L44 AND (?CANTILEVER? OR ?PROBE?)(3A)(FRONT
                 ###### OR FORWARD#####)(2A)(SUBSTRATE OR ?LAYER? OR ?COAT? OR
                 ?FILM? OR ?SURFACE? OR LAMEL? OR ?LAMINAT? OR OVERLAY? OR
                 PLATE OR SHEATH#### OR OVERLAID)
L50            1 SEA ABB=ON  PLU=ON  L44 AND (?CANTILEVER? OR ?PROBE?)(3A)(FRONT
                 ###### OR FORWARD#####)(2A)(SHEET#### OR ?DEPOSIT? OR FOIL OR
                 OVERSPREAD? OR UNDERLY#### OR OVERLY#### OR OVERLIE# OR UNDERLIE# OR COVER?)
L51          609 SEA ABB=ON  PLU=ON  (L27 OR L28 OR L29 OR L30)
L52           69 SEA ABB=ON  PLU=ON  L51 AND L31
L53            6 SEA ABB=ON  PLU=ON  L51 AND L7
L54          182 SEA ABB=ON  PLU=ON  L51 AND (L32 OR L33 OR L34)
L55           40 SEA ABB=ON  PLU=ON  L54 AND ?CANTILEVER?
L56          121 SEA ABB=ON  PLU=ON  L54 AND (G01N13-16 OR G01N13-10)/IPC,IC
L57           63 SEA ABB=ON  PLU=ON  L51 AND ?LENS?
L58            4 SEA ABB=ON  PLU=ON  L51 AND (MICROLENS? OR MICRO LENS###)
L59          235 SEA ABB=ON  PLU=ON  (L19 OR L20)
L60           19 SEA ABB=ON  PLU=ON  L59 AND L51
L61           19 SEA ABB=ON  PLU=ON  L59 AND L44
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L65         44 SEA ABB=ON  PLU=ON  L44 AND ?CANTILEVER?
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L69         20 SEA ABB=ON  PLU=ON  L51 AND (G01N1-28)/IPC,IC
L70        157 SEA ABB=ON  PLU=ON  (L68 OR L69)
L71          7 SEA ABB=ON  PLU=ON  L70 AND L59
L72          9 SEA ABB=ON  PLU=ON  L70 AND L65
L73        157 SEA ABB=ON  PLU=ON  L70 AND L51
L74          9 SEA ABB=ON  PLU=ON  L70 AND L41
L75          9 SEA ABB=ON  PLU=ON  L70 AND L39
L76         14 SEA ABB=ON  PLU=ON  L70 AND (L24 OR L25)
L77          9 SEA ABB=ON  PLU=ON  L70 AND ?CANTILEVER?
L78         42 SEA ABB=ON  PLU=ON  L70 AND (?CANTILEVER? OR ?PROBE)(3A)(TEST##
               ## OR OBSERV######## OR MEASUR########### OR DETECT##### OR
               DETERMIN###### OR GUAG### OR GAGE# OR GAGING OR QUANTIFY####
               OR QUANTIF######## OR EXAMIN##### OR VIEW##### OR WATCH####)
L79         12 SEA ABB=ON  PLU=ON  L70 AND (?CANTILEVER? OR ?PROBE?)(4A)(DEFOR
               M? OR VIBRAT###### OR BEND#### OR ELONGAT#### OR STRAIN### OR
               STRESS#### OR EXPANS#### OR SHEAR### OR TORSION? OR FLEXIB#####
               ## OR FRIABIL? OR STRETCH##### OR RESONANCE OR OSCILATT? OR PULSAT#####)
L80         27 SEA ABB=ON  PLU=ON  L70 AND (S03-E02F)/MC
L81          7 SEA ABB=ON  PLU=ON  L70 AND L59
L82        157 SEA ABB=ON  PLU=ON  L70 AND L66
L83          9 SEA ABB=ON  PLU=ON  L70 AND L39
L84          7 SEA ABB=ON  PLU=ON  L70 AND (L19 OR L20)
L85          1 SEA ABB=ON  PLU=ON  L70 AND L7
L86         72 SEA ABB=ON  PLU=ON  (L15 OR L16 OR L17 OR L18)
L87          9 SEA ABB=ON  PLU=ON  L70 AND L86
L88         43 SEA ABB=ON  PLU=ON  L86 AND L66
L89        242 SEA ABB=ON  PLU=ON  (L5 OR L10 OR L24 OR L27 OR L33 OR L34 OR
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               OR L53) OR L55 OR L58 OR (L60 OR L61 OR L62 OR L63 OR L64 OR
               L65) OR L67 OR L69 OR (L71 OR L72) OR (L74 OR L75 OR L76 OR
               L77 OR L78 OR L79 OR L80 OR L81) OR (L83 OR L84 OR L85) OR (L87 OR L88))
L90        103 SEA ABB=ON  PLU=ON  L89 AND (AT##(1W) FORCE MICROSCOP### OR
               ATOMIC FORCE MICROSCOP? OR SCANNING(1W) MICROSCOP? OR FORCE(W)
               MICROSCOP? OR ELECTRON(W) MICROSCOP? OR SFM OR AFM OR TRANSMISS
               ION(1W) MICROSCOP? OR PROBE(1W) MICROSCOP? OR TUNNEL#####(1W)MICROSCOP?)
L91         58 SEA ABB=ON  PLU=ON  L89 AND (V05-F01A5 OR V05-F04B6A)/MC
L92         41 SEA ABB=ON  PLU=ON  L89 AND (G12B21-08 OR G12B21-02 OR G12B21-22)/IPC,IC
L93        116 SEA ABB=ON  PLU=ON  L89 AND (G01N13-16 OR G01N13-10)/IPC,IC
L94        149 SEA ABB=ON  PLU=ON  (L90 OR L91 OR L92 OR L93)
L95        147 SEA ABB=ON  PLU=ON  L94 AND P/DT
L96          2 SEA ABB=ON  PLU=ON  L94 NOT L95
L97          1 SEA ABB=ON  PLU=ON  L96 NOT 2004-2008/PRY,PY
L98        105 SEA ABB=ON  PLU=ON  L95 AND 1980-2003/PRY,PY
L99         81 SEA ABB=ON  PLU=ON  L95 AND 2004-2008/PRY,PY
L100        66 SEA ABB=ON  PLU=ON  L95 NOT L99
L101       106 SEA ABB=ON  PLU=ON  L100 OR L98 OR L97
               D L101 ALL MEMBB 1-106
L102    404362 SEA ABB=ON  PLU=ON  (AT##(1W) FORCE MICROSCOP### OR ATOMIC
               FORCE MICROSCOP? OR SCANNING(1W) MICROSCOP? OR FORCE(W)
               MICROSCOP? OR ELECTRON(W) MICROSCOP? OR SFM OR AFM OR TRANSMISS
               ION(1W) MICROSCOP? OR PROBE(1W) MICROSCOP? OR TUNNEL#####(1W)MICROSCOP?)
L103      3633 SEA ABB=ON  PLU=ON  (V05-F01A5 OR V05-F04B6A)/MC
L104      2166 SEA ABB=ON  PLU=ON  (G12B21-08 OR G12B21-02 OR G12B21-22)/IPC,IC
L105    405498 SEA ABB=ON  PLU=ON  (L102 OR L103 OR L104)
L106       131 SEA ABB=ON  PLU=ON  L105 AND (MICROLENS#### OR MICRO LENS####)
L107         7 SEA ABB=ON  PLU=ON  L106 AND (TRANSPAREN?)
L108        19 SEA ABB=ON  PLU=ON  L106 AND (GLASS###)
L109      6945 SEA ABB=ON  PLU=ON  L105 AND (LENS###)
L110       109 SEA ABB=ON  PLU=ON  L109 AND (TRANSPAREN### OR TRANSLUCEN? OR
               GLASS### OR LUCENT OR CLEAR OR SEE THROUGH OR LUCID OR
               SEMITRANSPARENT OR (NON OR "NOT")(W)(OPAQUE) OR NONOPAQUE?)(2A)
               (SUBSTRATE OR ?LAYER? OR ?COAT? OR ?FILM? OR ?SURFACE? OR
               LAMEL? OR ?LAMINAT? OR OVERLAY? OR PLATE OR SHEATH###)
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L111         24 SEA ABB=ON  PLU=ON  L109 AND (TRANSPAREN### OR TRANSLUCEN? OR
                GLASS### OR LUCENT OR CLEAR OR SEE THROUGH OR LUCID OR
                SEMITRANSPARENT OR (NON OR "NOT")(W)(OPAQUE) OR NONOPAQUE?)(2A)
                (OVERLAID OR SHEET#### OR ?DEPOSIT? OR FOIL OR OVERSPREAD? OR
                UNDERLY#### OR OVERLY#### OR OVERLIE# OR UNDERLIE# OR COVER?)
L112        128 SEA ABB=ON  PLU=ON  (L110 OR L111)
L113          4 SEA ABB=ON  PLU=ON  L112 AND ?CANTILEVER?
L114         57 SEA ABB=ON  PLU=ON  L112 AND (LEVER OR BEAM OR TIP OR MICROTIP
                OR NANOTIP OR ?PROBE?)
L115         78 SEA ABB=ON  PLU=ON  L109 AND (MICROLENS? OR MICRO LENS?)
L116         17 SEA ABB=ON  PLU=ON  ((L106 OR L107 OR L108) OR (L112 OR L113
                OR L114 OR L115)) AND (G01N13-16 OR G01N13-10)/IPC,IC
L117         25 SEA ABB=ON  PLU=ON  ((L106 OR L107 OR L108) OR (L112 OR L113
                OR L114 OR L115)) AND (OPTIC#######)(2A)(OBSERV######## OR
                MEASUR########### OR DRIV#### OR VIEW##### OR INVESTIGAT? OR
                ANALYSIS OR ANALYS###### OR ANALYZ####### OR INSPECT#### OR
                EXAM########)
L118          5 SEA ABB=ON  PLU=ON  ((L106 OR L107 OR L108) OR (L112 OR L113
                OR L114 OR L115)) AND (OBSERV####### OR VIEW#### OR WATCH#####)
                (2A)(WINDOW OR LENS### OR MICROLENS#### OR GLASS###)
L119         11 SEA ABB=ON  PLU=ON  ((L106 OR L107 OR L108) OR (L112 OR L113
                OR L114 OR L115)) AND (LIGHT OR IRRAD## OR IRRADIAT###### OR
                RADIAT###### OR PHOTON)(2A)(OBSERV######## OR MEASUR###########
                 OR DRIV#### OR VIEW##### OR INVESTIGAT? OR ANALYSIS OR
                ANALYS###### OR ANALYZ####### OR INSPECT#### OR EXAM########)
L120          1 SEA ABB=ON  PLU=ON  ((L106 OR L107 OR L108) OR (L112 OR L113
                OR L114 OR L115)) AND (LIGHT OR IRRAD## OR IRRADIAT###### OR
                RADIAT###### OR PHOTON OR OPTIC#########)(2A)(DRIV####)
L121          0 SEA ABB=ON  PLU=ON  ((L106 OR L107 OR L108) OR (L112 OR L113
                OR L114 OR L115)) AND (G01N1-28)/IPC,IC
L122          4 SEA ABB=ON  PLU=ON  ((L106 OR L107 OR L108) OR (L112 OR L113
                OR L114 OR L115)) AND (REAR###### OR BACK#######)(2A)(?SURFACE?
                 OR ?FILM? OR SUBSTRATE OR GLASS### OR ?COAT? OR ?DEPOSIT? OR
                PLATE OR ?LAYER?)
L123        196 SEA ABB=ON  PLU=ON  (L106 OR L107 OR L108) OR (L113 OR L114 OR
                L115 OR L116 OR L117 OR L118 OR L119 OR L120 OR L121 OR L122)
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L125        101 SEA ABB=ON  PLU=ON  L124 AND (?CANTILEVER? OR LEVER OR BEAM OR
                TIP OR NANOTIP OR NANOTUBE OR CNT OR MICROTIP)
L126        131 SEA ABB=ON  PLU=ON  L124 AND (MICROLENS#### OR MICRO LENS?)
L127         62 SEA ABB=ON  PLU=ON  L125 AND L126
L128         33 SEA ABB=ON  PLU=ON  L127 AND P/DT
L129        100 SEA ABB=ON  PLU=ON  L124 AND P/DT
L130         88 SEA ABB=ON  PLU=ON  L124 NOT L129
L131         54 SEA ABB=ON  PLU=ON  L130 NOT 2004-2007/PY
L132         67 SEA ABB=ON  PLU=ON  L129 AND 1980-2003/PRY,PY
L133         59 SEA ABB=ON  PLU=ON  L129 AND 2004-2007/PRY,PY
L134         41 SEA ABB=ON  PLU=ON  L129 NOT L133
L135        123 SEA ABB=ON  PLU=ON  L134 OR L132 OR L131
                D L135 ALL MEMBB 1-123
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10:51:20 ON 25 JUL 2008
11:51:44 ON 25 JUL 2008

FILE 'PCI' ENTERED AT 10:51:20 ON 25 JUL 2008
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                E JP06267408/PN.D
L1           11 SEA ABB=ON  PLU=ON  JP06267408/PN.D
                E WO02103328/PN
                E WO2002103328/PN
                E WO2002103328/PN.D
                E JP2003114182/PN
                E JP2003114182/PN.D
L2            7 SEA ABB=ON  PLU=ON  JP2003114182/PN.D
                E JP10239325/PN
                E JP10239325/PN.D
L3            1 SEA ABB=ON  PLU=ON  JP10239325/PN.D
                E US20020024004/PN
                E US20020024004/PN.D
L4            2 SEA ABB=ON  PLU=ON  US20020024004/PN.D
                E JP2002005810/PN
                E JP2002005810/PN.D
L5            2 SEA ABB=ON  PLU=ON  JP2002005810/PN.D
L6           20 SEA ABB=ON  PLU=ON  (L1 OR L2 OR L3 OR L4 OR L5)
L7              SEL PLU=ON  L6 1- PRN :      39 TERMS
FILE 'HCAPLUS, WPIX, JAPIO, KOREAPAT' ENTERED AT 10:54:18 ON 25 JUL 2008
L8          117 SEA ABB=ON  PLU=ON  L7
L9           21 SEA ABB=ON  PLU=ON  L8 AND (G01N13-16 OR G01N13-10)/IPC,IC
L10          15 SEA ABB=ON  PLU=ON  L8 AND (G12B21-08 OR G12B21-02 OR G12B21-22)/IPC,IC
L11           3 SEA ABB=ON  PLU=ON  L8 AND (V05-F04B6A)/MC
L12           6 SEA ABB=ON  PLU=ON  L8 AND (V05-F01A5)/MC
L13           8 SEA ABB=ON  PLU=ON  L8 AND (S03-E02F)/MC
L14           0 SEA ABB=ON  PLU=ON  L8 AND (G01N1-28)/IPC,IC
L15           6 SEA ABB=ON  PLU=ON  L8 AND (TRANSPAREN### OR TRANSLUCEN? OR
                GLASS### OR LUCENT OR CLEAR OR SEE THROUGH OR LUCID OR
                SEMITRANSPARENT OR (NON OR "NOT")(W)(OPAQUE) OR NONOPAQUE?)(2A)
                (SUBSTRATE OR ?LAYER? OR ?COAT? OR ?FILM? OR ?SURFACE? OR
                LAMEL? OR ?LAMINAT? OR OVERLAY? OR PLATE OR SHEATH###)
L16           0 SEA ABB=ON  PLU=ON  L8 AND (TRANSPAREN### OR TRANSLUCEN? OR
                GLASS### OR LUCENT OR CLEAR OR SEE THROUGH OR LUCID OR
                SEMITRANSPARENT OR (NON OR "NOT")(W)(OPAQUE) OR NONOPAQUE?)(2A)
                (OVERLAID OR SHEET#### OR ?DEPOSIT? OR FOIL OR OVERSPREAD? OR
                UNDERLY#### OR OVERLY#### OR OVERLIE# OR UNDERLIE# OR COVER?)
L17           0 SEA ABB=ON  PLU=ON  L8 AND (MICROLENS#### OR MICRO LENS?)
L18          32 SEA ABB=ON  PLU=ON  L8 AND (?CANTILEVER?)
L19           5 SEA ABB=ON  PLU=ON  L8 AND (?CANTILEVER?)(3A)(PLURAL### OR AT
                LEAST OR MORE THAN ONE OR MULTIPLE OR MULTIPLIC###### OR MULTI
                OR MYRIAD OR MULTITUDE## OR 2ND OR 3RD OR SECOND OR THIRD OR
                NUMEROUS OR LARGE NUMBER OR GREAT NUMBER OR MANY OR SEVERAL OR TWO OR THREE OR GREATER)
L20           6 SEA ABB=ON  PLU=ON  L8 AND (OPTIC#######)(2A)(OBSERV########
                OR MEASUR########### OR DRIV#### OR VIEW##### OR INVESTIGAT?
                OR ANALYSIS OR ANALYS###### OR ANALYZ####### OR INSPECT#### OR EXAM########)
L21           2 SEA ABB=ON  PLU=ON  L8 AND (OBSERV####### OR VIEW#### OR
                WATCH#####)(2A)(WINDOW OR LENS### OR MICROLENS#### OR GLASS###)
L22           8 SEA ABB=ON  PLU=ON  L8 AND (S03-E02F)/MC
L23          27 SEA ABB=ON  PLU=ON  (L9 OR L10 OR L11 OR L12 OR L13) OR L15 OR (L19 OR L20 OR L21 OR L22)
L24          15 SEA ABB=ON  PLU=ON  L8 AND (REAR####### OR BACK###### OR BEHIND)
L25          10 SEA ABB=ON  PLU=ON  L8 AND (?CANTILEVER?)(3A)(TEST#### OR
                OBSERV######## OR MEASUR########### OR DETECT##### OR DETERMIN#
                ##### OR GUAG### OR GAGE# OR GAGING OR QUANTIFY#### OR
                QUANTIF######## OR EXAMIN##### OR VIEW##### OR WATCH#### OR
                (LIGHT OR IRRAD? OR RADIAT?)(1W)(REFLECT?))
L26           5 SEA ABB=ON  PLU=ON  L8 AND (?CANTILEVER?)(4A)(DEFORM? OR
                VIBRAT###### OR BEND#### OR ELONGAT#### OR STRAIN### OR
                STRESS#### OR EXPANS#### OR SHEAR### OR TORSION? OR FLEXIB#####
                ## OR FRIABIL? OR STRETCH##### OR RESONANCE OR OSCILATT? OR PULSAT#####)
L27          36 SEA ABB=ON  PLU=ON  (L23 OR L24 OR L25 OR L26)
L28          36 SEA ABB=ON  PLU=ON  L27 AND P/DT
L29          25 SEA ABB=ON  PLU=ON  L28 AND 1980-2003/PRY,PY
L30          32 SEA ABB=ON  PLU=ON  L28 AND 2004-2008/PRY,PY
L31           4 SEA ABB=ON  PLU=ON  L28 NOT L30
L32          25 SEA ABB=ON  PLU=ON  L31 OR L29
                D L32 ALL MEMBB 1-25
```

Search Report
For Patent Family
Member EP1655738

INTERNATIONAL SEARCH REPORT

International applicati
PCT/JP20C

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl^7 G12B21/08, G01N13/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int.Cl^7 G12B21/00-21/24, G01N13/10-13/24

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Toroku Jitsuyo Shinan Koho	1994-2004
Kokai Jitsuyo Shinan Koho	1971-2004	Jitsuyo Shinan Toroku Koho	1996-2004

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
JICST FILE(JOIS)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	JP 6-267408 A (Canon Inc.), 22 September, 1994 (22.09.94), Full text; all drawings (Family: none)	1,5-11 2-4
Y A	JP 10-239325 A (Seiko Instruments Inc.), 11 September, 1998 (11.09.98), Full text; all drawings (Family: none)	1,5 2-4
Y	JP 2002-5810 A (Canon Inc.), 09 January, 2002 (09.01.02), Full text; all drawings & US 2002/24004 A Full text; all drawings	6-11

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search 02 November, 2004 (02.11.04)	Date of mailing of the international search report 28 December, 2004 (28.12.04)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2004)

Sheet 1 of 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2004/011351

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2003-114182 A (Japan Science and Technology Corp.), 18 April, 2003 (18.04.03), Full text; all drawings & WO 02/103328 A Full text; all drawings	10,11

Form PCT/ISA/210 (continuation of second sheet) (January 2004)

Sheet 2 of 2

Derwent Patent Abstracts of Patents listed in Search Report

DERWENT-ACC-NO: 2003-112417

DERWENT-WEEK: 200843

TITLE: Cantilever array for scanning probe microscope, uses laser Doppler interferometer with specimen light excitation function

INVENTOR: KAWAKATSU H

PATENT-ASSIGNEE: DOKURITSU GYOSEI HOJIN KAGAKU GIJUTSU SH[DOKUN] , JAPAN SCI & TECHNOLOGY AGENCY[NISCN], JAPAN SCI & TECHNOLOGY CORP[NISCN], KAGAKU GIJUTSU SHINKO JIGYODAN[KAGAN], KAWAKATSU H[KAWAI]

PRIORITY-DATA: 2002JP-160482 (May 31, 2002) , 2001JP-184604 (June 19, 2001)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES
WO 02103328 A1	December 27, 2002	JA	52
JP 2003114182 A	April 18, 2003	JA	19
EP 1411341 A1	April 21, 2004	EN	23
KR 2004018279 A	March 2, 2004	KO	22
US 20040256552 A1	December 23, 2004	EN	23
JP 2005274585 A	October 6, 2005	JA	23
JP 2005308756 A	November 4, 2005	JA	25
US 20060231757 A1	October 19, 2006	EN	
US 20060253943 A1	November 9, 2006	EN	
US 20070018096 A1	January 25, 2007	EN	
EP 1775567 A2	April 18, 2007	EN	
EP 1775568 A2	April 18, 2007	EN	
EP 1775569 A2	April 18, 2007	EN	
EP 1775570 A2	April 18, 2007	EN	
US 7220962 B2	May 22, 2007	EN	
EP 1804050 A2	July 4, 2007	EN	
KR 2007012884 A	January 29, 2007	KO	
EP 1775567 A3	November 21, 2007	EN	
EP 1804050 A3	November 21, 2007	EN	
US 7309863 B2	December 18, 2007	EN	
JP 4076792 B2	April 16, 2008	JA	
JP 2008107358 A	May 8, 2008	JA	
KR 723849 B1	May 25, 2007	KO	
JP 2008134254 A	June 12, 2008	JA	
KR 783341 B1	December 7, 2007	KO	

DESIGNATED-STATES: KR US AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR CH DE FR GB LI CH DE FR GB LI AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR CH DE FR GB LI AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR CH DE FR GB LI

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
WO2002103328A1	N/A	2002WO-JP05835	June 12, 2002
JP2003114182A	N/A	2002JP-160482	May 31, 2002
JP 4076792B2	N/A	2002JP-160482	May 31, 2002
EP 1411341A1	N/A	2002EP-736066	June 12, 2002
EP 1411341A1	N/A	2002WO-JP05835	June 12, 2002
US20040256552A1	N/A	2002WO-JP05835	June 12, 2002
US 7220962B2	N/A	2002WO-JP05835	June 12, 2002
KR2007012884A	N/A	2002WO-JP05835	June 12, 2002
KR 723849B1	N/A	2002WO-JP05835	June 12, 2002
KR 783341B1	N/A	2002WO-JP05835	June 12, 2002
KR2004018279A	N/A	2003KR-716658	December 19, 2003
KR 723849B1	N/A	2003KR-716658	December 19, 2003
US20040256552A1	N/A	2004US-481443	August 2, 2004
US 7220962B2	N/A	2004US-481443	August 2, 2004
JP2005308756A	N/A	2005JP-153339	May 26, 2005
JP2005274585A	N/A	2005JP-153340	May 26, 2005
US20060231757A1	N/A	2006US-454986	June 19, 2006
US20070018096A1	N/A	2006US-454987	June 19, 2006
US20060253943A1	N/A	2006US-454989	June 19, 2006

US 7309863B2	N/A	2006US-454989	June 19, 2006
EP 1775567A2	N/A	2007EP-002540	June 12, 2002
EP 1775567A3	N/A	2007EP-002540	June 12, 2002
EP 1775568A2	N/A	2007EP-002541	June 12, 2002
EP 1775569A2	N/A	2007EP-002542	June 12, 2002
EP 1804050A2	N/A	2007EP-002543	June 12, 2002
EP 1804050A3	N/A	2007EP-002543	June 12, 2002
EP 1775570A2	N/A	2007EP-002544	June 12, 2002
KR2007012884A	N/A	2007KR-700669	January 10, 2007
KR 783341B1	N/A	2007KR-700669	January 10, 2007
JP2008134254A	N/A	2007JP-322893	December 14, 2007
JP2008107358A	Based on	2007JP-322903	December 14, 2007

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPP	G01B11/00	20060101
CIPP	G01B11/30	20060101
CIPP	G01G3/16	20060101
CIPP	G01N13/10	20060101
CIPP	G01N13/16	20060101
CIPP	G21K7/00	20060101
CIPS	B82B3/00	20060101
CIPS	G01B21/30	20060101
CIPS	G01B9/02	20060101
CIPS	G01H9/00	20060101
CIPS	G01N13/10	20060101
CIPS	G01N13/16	20060101
CIPS	G01N13/16	20060101
CIPS	G02B21/00	20060101
CIPS	G12B21/02	20060101
CIPS	G12B21/02	20060101
CIPS	G12B21/08	20060101
CIPS	G12B21/20	20060101
CIPS	G12B21/22	20060101
CIPS	G12B21/22	20060101

ABSTRACTED-PUB-NO: WO 02103328 A1

BASIC-ABSTRACT:

NOVELTY - The cantilever array comprises a large number of compliant cantilevers (3) sliding on the surface (2) of the specimen (1), sliding device of guide and rotation mechanism, a sensor, a homodyne laser interferometer, and a laser Doppler interferometer with specimen light excitation function.

USE - For scanning probe mechanism

ADVANTAGE - Cantilever array is formed in a simple structure and capable of accurately detecting the surface of a specimen.

DESCRIPTION OF DRAWING(S) - specimen (1)

surface (2)

compliant cantilevers (3)

CHOSEN-DRAWING: Dwg.1/25

TITLE-TERMS: CANTILEVER ARRAY SCAN PROBE MICROSCOPE LASER DOPPLER INTERFEROMETER SPECIMEN LIGHT EXCITATION FUNCTION

DERWENT-CLASS: P81 Q68 S02 S03 V05

EPI-CODES: S02-A03A; S03-E02F1; S03-E06B1; V05-F01A1B; V05-F04B6;

SECONDARY-ACC-NO:
Non-CPI Secondary Accession Numbers: 2003-089467

DERWENT-ACC-NO: 1998-545881

DERWENT-WEEK: 200401

TITLE: Specimen container for specimen observation in liquid has transparent glass substrate provided with transparent electrode film, and ring that keeps liquid in and which is provided on transparent electrode film through glass substrate

INVENTOR: UMEKI T; USHIKI T

PATENT-ASSIGNEE: SEIKO INSTR INC[DASE]

PRIORITY-DATA: 1997JP-042714 (February 26, 1997)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE
JP 10239325 A	September 11, 1998	JA
JP 3480546 B2	December 22, 2003	JA

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP 10239325A	N/A	1997JP-042714	February 26, 1997
JP 3480546B2	Previous Publ	1997JP-042714	February 26, 1997

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPP	G01N1/28	20060101
CIPS	G01N13/10	20060101
CIPS	G01N37/00	20060101
CIPS	G02B21/34	20060101

ABSTRACTED-PUB-NO: JP 10239325 A

BASIC-ABSTRACT:

The container includes a transparent glass substrate (10) provided with a transparent electrode film (11) that generates heat when electric power is supplied.

A ring (14) for keeping liquid in is provided on the transparent electrode film through the glass substrate which is provided for insulation.

ADVANTAGE - Simplifies correct alignment of probe of scanning probe microscope with observation position of specimen. Cantilever is not influenced by reflux of liquid, thereby enabling continuous observation during liquid recirculation.

CHOSEN-DRAWING: Dwg.1/3

TITLE-TERMS: SPECIMEN CONTAINER OBSERVE LIQUID TRANSPARENT GLASS SUBSTRATE ELECTRODE FILM RING KEEP THROUGH

DERWENT-CLASS: P81 S03 V05

EPI-CODES: S03-E02F; S03-E13D; V05-F01A5; V05-F04G;

SECONDARY-ACC-NO:
Non-CPI Secondary Accession Numbers: 1998-425130

DERWENT-ACC-NO: 2002-392805

DERWENT-WEEK: 200532

TITLE: Probe for detecting/irradiating light in, e.g., information processing apparatus, comprises cantilever, hollow tip, microaperture and hollow waveguide

INVENTOR: KURODA A; KURODA R ; SHIMADA Y

PATENT-ASSIGNEE: CANON KK[CANO] , KURODA R[KUROI], SHIMADA Y[SHIMI]

PRIORITY-DATA: 2000JP-180894 (June 16, 2000) , 2001US-879905 (June 14, 2001)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE
US 20020024004 A1	February 28, 2002	EN
JP 2002005810 A	January 9, 2002	JA
US 6891151 B2	May 10, 2005	EN

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
US20020024004A1	N/A	2001US-879905	June 14, 2001
JP2002005810A	N/A	2000JP-180894	June 16, 2000
US 6891151B2	N/A	2001US-879905	June 14, 2001

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPP	G01B11/30	20060101
CIPS	B81B1/00	20060101
CIPS	B81C1/00	20060101
CIPS	G01N13/10	20060101
CIPS	G01N13/14	20060101
CIPS	G02B6/10	20060101
CIPS	G02B6/122	20060101
CIPS	G02B6/24	20060101
CIPS	G11B7/135	20060101
CIPS	G11B7/22	20060101
CIPS	G12B21/02	20060101
CIPS	G12B21/06	20060101

RELATED-ACC-NO: 2005-783988 2006-299030

ABSTRACTED-PUB-NO: US 20020024004 A1

BASIC-ABSTRACT:

NOVELTY - A probe for detecting light or irradiating light comprises

(a) a cantilever (7) having an end supported by a substrate (11),

(b) a hollow tip (6) formed at the cantilever free end,

(c) a microaperture (8) formed at the end of the tip, and

(d) a hollow waveguide (9) formed inside the cantilever.

DESCRIPTION - INDEPENDENT CLAIMS are also included for (A) a method for producing a probe for light detection or light irradiation comprising (i) working a substrate to form a groove, (ii) forming a flat plate-shaped cover portion on the groove to form a hollow waveguide having an opening in a part, (iii) forming a hollow tip having a microaperture on the opening, and (iv) removing a part of the substrate by etching to form a cantilever; (B) an exposure apparatus provided with the inventive probe; and (C) an information processing apparatus provided with the inventive probe.

USE - For evanescent light detection/irradiation useful in a near field optical microscope. It can also be used in exposure apparatus and in information processing apparatus (claimed).

ADVANTAGE - The probe is capable of reducing the light transmission loss between the waveguide and the optical microaperture or that in the short wavelength region in the waveguide while maintaining the advantage of fabricating easily the probes by easy integration and easy size reduction. The probe can be fabricated by a batch process with a high productivity and a satisfactory process reproducibility of the optical microaperture.

DESCRIPTION OF DRAWING(S) - The figure shows the inventive probe.

Tip (6)

Cantilever (7)

Microaperture (8)

Hollow waveguide (9)

Mirror (10)

Substrate (11)

EQUIVALENT-ABSTRACTS:

ELECTRONICS

Preferred Components: The waveguide has a V-shaped or U-shaped transversal cross section. The tip is shaped as a square cone. The probe is provided with a mirror (10) for guiding light transmitted in a hollow interior of the hollow waveguide to the microaperture or guiding light entering from the microaperture to the hollow waveguide. The mirror is a concave mirror. Preferred Method: The groove is formed by etching, preferably crystal-anisotropic etching the substrate. The method further includes a surface treatment step of forming the groove or the cover portion into a mirror surface state. The cover portions are formed from a silicon-on-insulator (SOI) layer of an SOI substrate. The cover portion may also be formed by filling the groove with a resin layer and forming a metal film on the resin layer. The step of forming the hollow tip having the microaperture on the opening comprises (i) forming a film of a tip material on a recess formed on a substrate, (i) transferring the tip material onto the opening, and (iii) etching the end of a follow tip resulting from the transferring step to form the microaperture.

INORGANIC CHEMISTRY

Preferred Materials: The cantilever is composed of silicon.

CHOSEN-DRAWING: Dwg.1b/12

TITLE-TERMS: PROBE DETECT IRRADIATE LIGHT INFORMATION PROCESS APPARATUS COMPRISE CANTILEVER HOLLOW TIP WAVEGUIDE

DERWENT-CLASS: L03 S03 V05

CPI-CODES: L03-G02; L04-E05;

EPI-CODES: S03-E02F; S03-E06B1;

SECONDARY-ACC-NO:
CPI Secondary Accession Numbers: 2002-110435
Non-CPI Secondary Accession Numbers: 2002-307917

DERWENT-ACC-NO: 1994-344561

DERWENT-WEEK: 199443

TITLE: Optical displacement detection sensor for scanning probe microscope uses cantilevered support structure and Fabry-Perot resonator to detect minute displacements, and has reflecting surfaces between probe and transparent substrate

INVENTOR: KURODA A; OGUCHI T ; SAKAI K ; TODOKORO Y

PATENT-ASSIGNEE: CANON KK[CANO]

PRIORITY-DATA: 1993JP-072841 (March 9, 1993)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE
JP 06267408 A	September 22, 1994	JA

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP 06267408A	N/A	1993JP-072841	March 9, 1993

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPP	G01B21/30	20060101
CIPS	B81B3/00	20060101
CIPS	B81C1/00	20060101
CIPS	B82B3/00	20060101
CIPS	G01N13/12	20060101
CIPS	G01N37/00	20060101
CIPS	G11B9/00	20060101
CIPS	G11B9/14	20060101
CIPS	H01J37/28	20060101
CIPS	H01J9/14	20060101
CIPS	H01L41/09	20060101

ABSTRACTED-PUB-NO:

EQUIVALENT-ABSTRACTS:

CHOSEN-DRAWING: Dwg.1/8

TITLE-TERMS: OPTICAL DISPLACEMENT DETECT SENSE SCAN PROBE MICROSCOPE CANTILEVER SUPPORT STRUCTURE FABRY PEROT RESONANCE MINUTE REFLECT SURFACE TRANSPARENT SUBSTRATE

ADDL-INDEXING-TERMS:
TUNNELLING ATOMIC FORCE

DERWENT-CLASS: J04 L03 S02 S03 T03 V05

CPI-CODES: J04-C; L03-C04; L03-D04D;

EPI-CODES: S02-A08E; S03-E02F; S03-E06B1;

SECONDARY-ACC-NO:
CPI Secondary Accession Numbers: 1994-156821
Non-CPI Secondary Accession Numbers: 1994-270393

L101 ANSWER 71 OF 106 COPYRIGHT THOMSON REUTERS on STN
AN 2000-058821 [05] WPIX
DNN N2000-046047 [05]
TI **Probe** tip structure for **scanning** type
microscope - has scattering element extending from **probe**
base, whose **rear** side is **covered** by
transparent film
DC S02
IN SASAKI Y
PA (OLYU-C) OLYMPUS OPTICAL CO LTD
CYC 1
PI JP 11316241 A 19991116 (200005)* JA 11[10] <--
ADT ~~JP 11316241 A JP 1998-~~122196 19980501
PRAI JP 1998-122196 **19980501**
IPCR G01B0011-30 [I,A]; G01B0011-30 [I,C]; **G01N0013-10** [I,C];
G01N0013-14 [I,A]; G01N0037-00 [I,A]; G01N0037-00 [I,C]
AB JP 11316241 A UPAB: 20050409
NOVELTY - The **probe** (8) consists of a scattering element (202) projecting from base (200). Light is scattered to end of **probe** by the scattering element. On the backside of scattering element, a **transparent** aluminum **film** (20) is formed.
DETAILED DESCRIPTION - The **probe** has rectangular lever (12), that has a projection (10) at the free end. On the peripheral of scattering element a smooth convex flat surface is provided.
USE - For **scanning** type **microscope** used for **specimen analysis**.
ADVANTAGE - Enables detection of scattered light of large angle range, as the detection angle of scattered light is limited. DESCRIPTION OF DRAWING(S) - The figure shows the perspective **view** of **probe**. (8) **Probe**; (10) Projection; (12) Lever; (20) **Transparent** aluminum **film**; (200) Base; (202) Scattering element.
MC EPI: S02-A03B5; S02-J04B1

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L32  ANSWER 10 OF 25   COPYRIGHT THOMSON REUTERS on STN
AN   2005-233000 [24]   WPIX
DNN  N2005-192013 [24]
TI   Probe of scanning-type probe microscope, has light measurement
     cantilever provided at head of supporting cantilever extended
     horizontally from base, has length of 20 micrometer or less and thickness
     of 1 micrometer or less
DC   S03; V05
IN   KAWAKATSU H; KOBAYASHI D
PA   (NISC-N) JAPAN SCI & TECHNOLOGY AGENCY
CYC  107
PI   WO 2005020243    A1 20050303 (200524)* JA  30[13]
     EP 1667164       A1 20060607 (200638)  EN
     KR 2006036456    A  20060428 (200672)  KO
     JP 2005513248    X  20061116 (200675)  JA  18
     US 20070108159   A1 20070517 (200734)  EN
     RU 2320034       C2 20080320 (200823)  RU
PRAI JP 2003-275200       20030716
IPCI C23F0001-00 [I,A]; C23F0001-00 [I,C]; G01N0013-10 [I,A];
     G01N0013-16 [I,A]; G12B0021-00 [I,C]; G12B0021-00 [I,C];
     G12B0021-02 [I,A]; G12B0021-08 [I,A]; H01J0040-00 [I,C];
     H01J0040-14 [I,A]
IPCR G12B0021-00 [I,C]; G12B0021-02 [I,A]
EPC  G01Q0245-16
ICO  Y01N0008:00
NCL  NCLM  216/002.000
     NCLS  250/234.000
AB    WO 2005020243 A1   UPAB: 20050708
      NOVELTY - A light measurement cantilever (24) provided at the head of a
      supporting cantilever (23) extended horizontally from the base (21), has length
      of 20 micrometer or less and thickness of 1 micrometer or less.
      DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for method for
      manufacturing of probe of scanning-type probe microscope.
      USE - Probe of scanning-type probe microscope.
      ADVANTAGE - Performs accurate measurement without the base of cantilever coming
      in contact with the object to-be-measured and without the object being hidden
      by the base of probe. DESCRIPTION OF DRAWINGS - The figure shows the
      perspective of the probe of scanning-type probe microscope. bases (21,31)
      supporting cantilevers (23,33) light measurement cantilevers (24,34)
MC   EPI: S03-E02F; V05-F01A5; V05-F01B3;
          V05-F04B6A
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L101 ANSWER 72 OF 106  COPYRIGHT THOMSON REUTERS on STN
AN    1999-390418 [33]   WPIX
DNN   N1999-292829 [33]
TI    Identification system in cantilever assembly for scanning
      probe of scanning type electron microscope  -
      has unique identification mark recorded on substrate on which
      cantilever is mounted, to identify type of cantilever
DC    S03; V05
IN    SATO Y; SHIMIZU N
PA    (DASE-C) SEIKO INSTR INC
CYC   2
PI    JP 11153610      A  19990608 (199933)* JA  5[11]                <--
      US 6176122       B1 20010123 (200107)  EN                       <--
      JP 3466067       B2 20031110 (200377)  JA  5                    <--
ADT   JP 11153610 A JP 1997-320185 19971120; JP 3466067 B2 JP 1997-320185
      19971120; US 6176122 B1 US 1998-197587 19981119
FDT   JP 3466067 B2 Previous Publ JP 11153610 A
PRAI  JP 1997-320185        19971120
IPCR  G01N0013-10 [I,A]; G01N0013-10 [I,C];
      G01N0013-16 [I,A]; G01N0037-00 [I,A]; G01N0037-00 [I,C];
      G12B0021-00 [I,C]; G12B0021-02 [I,A]; G12B0021-08
      [N,A]; G12B0021-10 [N,A]; H01J0037-28 [I,A]; H01J0037-28 [I,C]
EPC   G01B0007-34A1A1; G01Q0245-00
ICO   S12B0021:08; S12B0021:10; Y01N0008:00
AB     JP 11153610 A   UPAB: 20050521
       NOVELTY - A self-detection type cantilever (70) is mounted on the epoxy glass
       substrate (80) to form a cantilever assembly (10). Unique identification marks
       (91,91a) are recorded on the substrate, to identify the type of cantilever
       assembly, such as AFM or MFM type.
       USE - In scanning probe of electron microscope.
       ADVANTAGE - Offers simple and easy method for identification of type of
       cantilever by referring identification mark. DESCRIPTION OF DRAWING(S) - The
       figure shows the top view of cantilever assembly. (10) Cantilever assembly;
       (70) Self- detection type cantilever; (80) Epoxy glass substrate; (91,91a)
       Unique identification marks.
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L32  ANSWER 12 OF 25  COPYRIGHT THOMSON REUTERS on STN
AN   2004-553387 [53]   WPIX
DNN  N2004-437816 [53]
TI   Oscillation frequency measurement method for multi
     cantilevers for vibration meter, involves exciting
     natural frequencies of cantilevers sequentially by modulating
     optical excitation to measure vibration by laser Doppler
     meter
DC   S02; S03; V05
IN   KAWAKATSU H
PA   (DOKU-N) DOKURITSU GYOSEI HOJIN KAGAKU GIJUTSU SH; (NISC-N) JAPAN SCI &
     TECHNOLOGY AGENCY; (KAWA-I) KAWAKATSU H
PI   WO 2004061427    A1 20040722 (200453)* JA  12[6]
     JP 2004212078    A  20040729 (200453)  JA  13
     EP 1577660       A1 20050921 (200562)  EN
     KR 2005088237    A  20050902 (200648)  KO
     US 20060162455   A1 20060727 (200650)  EN
     JP 3958206       B2 20070815 (200755)  JA  13
     RU 2313141       C2 20071220 (200804)  RU
     KR 699209        B1 20070328 (200820)  KO
PRAI JP 2002-378996        20021227
IC   ICM G01N013-16
IPCI G01B0005-28 [I,A]; G01B0005-28 [I,C]; G01H0013-00 [I,A]; G01H0013-00
     [I,C]; G01N0013-10 [I,A]; G01N0013-10 [I,C];
     G01N0013-10 [I,C]; G01N0013-16 [I,A]; G12B0021-00 [I,C];
     G12B0021-00 [I,C]; G12B0021-08 [I,A]; G12B0021-22
     [I,A]
IPCR G01H0009-00 [I,A]; G01H0009-00 [I,C]; G01N0013-10 [I,A];
     G01N0013-10 [I,C]; G12B0021-00 [I,C]; G12B0021-02 [N,A];
     G12B0021-08 [I,A]
EPC  G01H0009-00; G01N0013-10; G01Q0210-02; G01Q0210-04; G01Q0240-30;
     G01Q0245-06
ICO  S12B0021:02C6; Y01N0008:00
NCL  NCLM  073/579.000
     NCLS  073/105.000
AB    WO 2004061427 A1   UPAB: 20060122
      NOVELTY - A cantilever array (11) consists of cantilevers (2-n), each having
      different natural frequencies. The natural frequencies are sequentially excited
      by modulating optical excitation to measure the vibration by a laser Doppler
      meter.
      DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:
      (1) oscillation frequency of multi cantilever; (2) scanning-type probe
      microscope; and (3) mass substance detector.
      USE - For measuring oscillation frequency of multi cantilevers, in vibration-
      meter, scanning-type probe microscope (claimed), mass substance detector
      (claimed).
      ADVANTAGE - Eliminates the need of incorporating an exciting or detecting
      element in each cantilever and simplifies the structure of cantilevers by means
      of optical pumping and optical measuring. Provides high Q values and
      diversities of high-frequency operations and modification processes to
      cantilevers. DESCRIPTION OF DRAWINGS - The figure shows a schematic view of the
      multi cantilevers.
      cantilever array (11)
      cantilevers (2-n)
MC    EPI: S02-A03B4; S02-E01; S03-E02F; V05-F01A5;
           V05-F01B5A; V05-F04B6A
```

L101 ANSWER 9 OF 106
AN 2003:902946 HCAPLUS
ED Entered STN: 19 Nov 2003
TI Scan **probe microscope** [Machine Translation].
IN Amakusa, Takaaki
PA Jeol Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM G01N013-16
ICS G01B021-30; G01N013-10
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003329565	A	20031119	JP 2002-132592	20020508 <--
PRAI	JP 2002-132592		20020508 <--		

AB [Machine ~~Translation of Descriptors~~]. Decrease of the resolution which it occurs due to the fact that the **transparent plate vibrates** to the **cantilever** and simultaneous is prevented. Stabilizing the light ray in the liquid, in order to introduce, in order to touch to the liquid level, making the **probe** which had the liquid middle cell where the **transparent plate** is installed, is installed in the **cantilever** point the sample **surface** approach, the **transparent plate**, becoming independent with the vibrating body which consists of the **cantilever** and the like in the scan **probe microscope** which **detects sample** surface information, it is kept in the liquid medium cell adjacent holder.

L101 ANSWER 5 OF 106 COPYRIGHT ACS on STN
AN 2004:648677 HCAPLUS
ED Entered STN: 12 Aug 2004
TI Probe for an optical near field microscope and method for producing the same
IN Brandenburg, Albrecht; Kuenzel, Christa; Eberhard, Dietmar
PA Fraunhofer-Gesellschaft Zur Foerderung Der Angewandten Forschung E.V., Germany
SO PCT Int. Appl.
CODEN: PIXXD2
DT Patent
LA German
IC ICM G12B021-06
ICS G12B021-02
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2004068501	A2	20040812	WO 2003-EP14555	20031218 <--
	WO 2004068501	A3	20041104		
	DE 10303961	A1	20040826	DE 2003-10303961	20030131 <--
	DE 10303961	B4	20050324		
	AU 2003298211	A1	20040823	AU 2003-298211	20031218 <--
	EP 1588383	A2	20051026	EP 2003-795926	20031218 <--
	JP 2006514273	T	20060427	JP 2004-567318	20031218 <--
	US 20060050373	A1	20060309	US 2005-193962	20050729 <--
PRAI	DE 2003-10303961	A	20030131 <--		
	WO 2003-EP14555	W	20031218 <--		

AB The invention relates to a **probe** for an optical near field microscope, said **probe** comprising a tip which is formed on a self-contained carrier, and to a method for producing the same. The aim of the invention is to provide a **probe** for an optical near field microscope and a method for the production thereof, whereby the **probe** has a tip with a very small aperture diameter and can thus be produced in a reproducible manner, according to a simple, advantageously controllable method. To this end, the inventive **probe** is characterised in that the **probe** tip is embodied as a complete structure which is applied to a planar surface of the carrier, and the inventive method comprises the following steps: a **transparent layer** is applied to a substrate, the thickness of the **transparent layer** corresponding to at least the height of the **probe** tip; the **transparent layer** is masked in at least one region of the **probe** tip; and the **transparent layer** is etched, forming the **probe** tip.

L101 ANSWER 11 OF 106 COPYRIGHT ACS on STN
AN 2003:774588 HCAPLUS
ED Entered STN: 03 Oct 2003
TI Scanning **probe** system with spring **probe**
IN Hantschel, Thomas; Chow, Eugene M.; Fork, David K.
PA Xerox Corporation, USA
SO U.S. Pat. Appl. Publ.
CODEN: USXXCO
DT Patent
LA English
IC ICM G01N023-00
INCL 073105000; 250306000
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
PI	US 20030182993	A1	20031002	US 2002-112215	20020329	<--
	US 20030183761	A1	20031002	US 2002-136258	20020430	<--
	JP 2003307483	A	20031031	JP 2003-79950	20030324	<--
	EP 1351256	A2	20031008	EP 2003-7302	20030331	<--
	EP 1351256	A3	20060517			
	US 20040123651	A1	20040701	US 2003-717803	20031119	<--
PRAI	US 2002-112215	A2	20020329			<--

AB Scanning **probe** systems, which include **scanning probe microscopes** (SPMs), **atomic force microscope** (AFMs), or profilometers, are disclosed that use **cantilevered** spring (e.g., **stressy** metal) **probes** formed on **transparent substrates**. When released, a free end bends away from the substrate to form the **cantilevered** spring **probe**, which has an in-plane or out-of-plane tip at its free end. The spring **probe** is mounted in a scanning **probe** system and is used to scan or otherwise **probe** a substrate surface. A laser beam is directed through the **transparent substrate** onto the **probe** to measure tip movement during scanning or probing. Other detection schemes can also be used (e.g., interferometry, capacitive, piezoresistive). The **probes** are used for topography, electrical, **optical** and thermal **measurements**. The **probes** also allow an SPM to operate as a depth gauge.

L101 ANSWER 16 OF 106 COPYRIGHT ACS on STN
AN 2002:821205 HCAPLUS
ED Entered STN: 29 Oct 2002
TI High frequency-bandwidth **optical** technique to **measure** thermal elongation time responses of near-field **scanning** optical **microscopy probes**
AU ~~Biehler, B.; La Rosa, A. H.~~
CS Department of Physics, Portland State University, Portland, OR, 97207, USA
SO Review of Scientific Instruments (2002), 73(11), 3837-3840
~~CODEN: RSINAK; ISSN: 0034-6748~~
PB American Institute of Physics
DT Journal
LA English
AB A near-field scanning optical **microscopy** (NSOM) **probe elongates** when light is coupled into it. The time response of this thermal process is measured here by a new optical technique that exploits the typical flat-apex morphol. of the **probe** as a mirror in a Fabry-Perot type cavity. Pulsed laser light is coupled into the **probe** to heat up the tip, while another continuous wave laser serves to monitor the elongation from the interference pattern established by the reflections from the flat-apex **probe** and a **semitransparent** metal-coated flat sample. A quarter wave plate is introduced into the interferometer optical path in order to maximize the signal to noise level, thus allowing the elongation of the tip to be monitored in real time. This optical technique, unlike other methods based on electronic feedback response, avoids limited frequency bandwidth restrictions. We have measured response time consts. of 500 and 40 μs. The technique presented here will help determine the power levels, operating **probe-sample** distance, and pulse repetition rate requirements for safe operation of NSOM instrumentation. In addition to NSOM, the instrumentation described in this article could also impact other areas that require large working range, accuracy, and high-speed response.

L101 ANSWER 35 OF 106
AN 2004-542242 [52] WPIX
CR 2003-844058; 2003-875194
DNC C2005-217621 [74]
DNN N2005-587201 [74]
TI Scanning **probe** system for use in determining electrical characteristics between two locations on a **sample** includes a **probe** assembly including **two** spring **probes**, and electrical measurement device including two terminals
DC A89; S02; S03; T04; V05
IN CHOW E M; FORK D K; HANTSCHEL T
PA (XERO-C) XEROX CORP
PI US 20040123651 A1 20040701 (200452)* EN 21[25]
US 6788086 B2 20040907 (200459) EN
ADT US 20040123651 A1 Div Ex US 2002-112215 20020329; US 20040123651 A1 US 2003-717803 20031119
FDT US 20040123651 A1 Div ex US 6668628 B
PRAI US 2003-717803 20031119
US 2002-112215 20020329
IPCR ~~B81B0003-00 [I,A]; B81B0003-00~~ [I,C]; G01B0021-30 [I,A]; G01B0021-30 [I,C]; **G01N0013-10** [I,A]; **G01N0013-10** [I,C]; **G01N0013-16** [I,A]; G12B0021-00 [I,C]; **G12B0021-02** [I,A]

AB US 20040123651 A1 UPAB: 20060203
NOVELTY - A scanning **probe** system includes a **probe** assembly, and electrical **measurement** device. The **probe** assembly includes **two** spring **probes**, each having fixed end attached to the substrate, a curved central section, and a free end including a **probe** tip for contacting a location of the sample (115). The electrical measurement device has **two** terminals. The spring **probes** comprise **stress**-engineered spring material films having an internal stress gradient.
DETAILED DESCRIPTION - A scanning **probe** system comprises a stage having a surface (116) for mounting the **sample**, a **probe** assembly, and electrical **measurement** device. The **probe** assembly includes a substrate, a first spring **probe** and **second** spring **probe**. Each spring **probe** has fixed end attached to the substrate, a curved central section, and a free end including a **probe** tip for contacting a location of the **sample**. The electrical **measurement** device has a first terminal connected to the first spring **probe**, and a **second** terminal connected to the **second** spring **probe**. The spring **probes** comprise **stress** - engineered spring material films having an internal stress gradient.
USE - The scanning **probe** system is for use in determining electrical characteristics between two locations on a sample. It is used for topography, electrical, **optical**, and thermal **measurements**.
ADVANTAGE - The inventive scanning **probe** system facilitates topography **measurements** that are not possible using conventional **probes**. It is capable of measuring deep and/or high-aspect ratio micro electrical mechanical system devices and performs non-destructive depth profiling of wafers structured by deep reactive ion etching, which are not possible using conventional **probes**. It has smaller geometry.
DESCRIPTION OF DRAWINGS - The drawing shows a perspective view of the inventive scanning **probe microscope** system.
Scanning **probe microscope** (100) XY stage (110)
Sample (115)
Surface (116)
Holder plate (130)
Motor (135)
Probe measurement device (140) Computer/workstation (150)

MC CPI: A12-L04B
EPI: S02-A02X; **S03-E02F**; S03-E06B1

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L101 ANSWER 39 OF 106  COPYRIGHT THOMSON REUTERS on STN
AN   2003-875194 [81]   WPIX
TI   Scanning probe system for probing sample
     comprises stage having surface for mounting sample,
     probe assembly having substrate and spring probe, and
     measurement device for measuring deformation
     of spring probe
IN   CHOW E M; FORK D; FORK D K; HANTSCHEL T
PA   (XERO-C) XEROX CORP
CYC  33
PI   US 20030182993  A1 20031002 (200381)* EN  10[25]              <--
     EP 1351256      A2 20031008 (200381)  EN                      <--
     JP 2003307483   A  20031031 (200381)  JA  17                  <--
     US 6668628      B2 20031230 (200402)  EN                      <--
ADT  US 20030182993 A1 US 2002-112215 20020329; JP 2003307483 A JP 2003-79950
     20030324; EP 1351256 A2 EP 2003-7302 20030331
PRAI US 2002-112215       20020329
IPCI B81B0001-00 [I,A]; B81B0001-00 [I,C]; B81B0003-00 [I,A]; B81B0003-00
     [I,C]; G01N0013-10 [I,A]; G01N0013-10 [I,C];
     G01N0013-16 [I,A]; G12B0021-00 [I,C]; G12B0021-02 [I,A];
     G12B0021-08 [I,A]
IPCR B81B0003-00 [I,A]; B81B0003-00 [I,C]; G01B0021-30 [I,A]; G01B0021-30
     [I,C]; G01N0013-10 [I,A]; G01N0013-10 [I,C];
     G01N0013-16 [I,A]; G12B0021-00 [I,C]; G12B0021-02 [I,A]
AB    US 20030182993 A1   UPAB: 20060121
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NOVELTY - A scanning **probe** system (100) comprises: (i) stage (110) having surface (116) for mounting the sample (115); (ii) **probe** assembly having substrate (122), and spring **probe** (125) having fixed end attached to the substrate, central section, and free end with **probe** tip; and (iii) measurement device (140) for measuring **deformation** of the spring **probe** caused by interaction between the **probe** tip and the sample.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for: (a) a method for **measuring** a **sample** using scanning **probe** system comprising mounting into the scanning **probe** system a **probe** assembly, causing the **probe** tip to interact with the **sample**, and **measuring deformation** of the spring **probe**; and (b) a method for forming **probe** assembly for scanning **probe** system comprising forming spring material film on release material, etching the spring material film to form spring material island, masking a fixed end portion of the spring material island, and removing the release material from beneath unmasked **cantilever** section of the spring material island.

USE - For **probing sample**, **measuring** the depth of structures formed on **sample**, and determining electrical characteristics between two locations on sample (claimed).

ABEN Scanning **probe** systems, which include **scanning probe microscopes** (SPMs), **atomic force microscope** (**AFMs**), or profilometers, are disclosed that use **cantilevered** spring (e.g., **stressy** metal) **probes** formed on **transparent substrates**. When released, a free end bends away from the substrate to form the **cantilevered** spring **probe**, which has an in-plane or out-of-plane tip at its free end. The spring **probe** is mounted in a scanning **probe** system and is used to scan or otherwise **probe** a substrate surface-. A laser beam is directed through the **transparent substrate** onto the **probe** to **measure** tip movement during scanning or probing. Other detection schemes can also be used (e.g., interferometry, capacitive, piezoresistive). The **probes** are used for topography, electrical, optical and thermal **measurements**. The **probes** also allow an SPM to operate as a depth gauge.

L101 ANSWER 56 OF 106 COPYRIGHT THOMSON REUTERS on STN

AN 2002-697524 [75] WPIX

TI Cantilever sensor measurement head, for measuring static and dynamic properties, e.g. deflection, has cantilever array, light source, position sensitive detector, and cylindrical lens

DC A89; B04; D16; J04; S02; S03; V06

IN BABCOCK K L; MASSIE J R; MEYER C R; PRATER C; SU C; TURNER M G

PA (VEEC-N) VEECO INSTR INC

PI US 20020092340 A1 20020718 (200275)* EN 40[21] <--
WO 2003038409 A1 20030508 (200331) EN <--
AU 2002258581 A1 20030512 (200464) EN <--

PRAI US 2001-999681 20011030
US 2000-244798P 20001030

IPCR G01N0009-00 [N,A]; G01N0009-00 [N,C]; G02B0007-182 [I,A]; G02B0007-182 [I,C]; G12B0021-00 [I,C]; G12B0021-02 [I,A]

AB US 20020092340 A1 UPAB: 20060120

NOVELTY - A cantilever sensor measurement head comprises a cantilever array with at least two cantilevers; a light source (1) that directs a light beam onto the cantilever; a position sensitive detector (6) that receives the light reflected by the cantilever; and a cylindrical lens (2) positioned in a path of the reflected light beam and between the cantilever and the position sensitive detector.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for: (a) a cantilever sensor measurement system, comprising the cantilever array; a detection system that generates a deflection signal indicative of deflection of the cantilever; a clocking device that generates a clock signal having an associated frequency; a gating circuit that generates a gating signal with a time width based on a selected number of oscillation cycles of the deflection signal; and a pulse counter that counts the oscillations of the clock signal during the time width based on the gating signal; (b) a method of measuring the oscillatory properties of the cantilever(s), comprising oscillating the cantilever array; detecting the deflection of the cantilever and generating the deflection signal based on the deflection; generating the clock signal with the associated frequency; generating the gating signal with the time width; and counting the oscillations of the clock signal based on the gating signal;

(c) an apparatus for mounting the cantilever sensor array in the measurement head, comprising a flow cell; and a mounting stub coupled to the flow cell and having a cutout that supports the cantilever sensor array;

(d) a method of mounting the cantilever sensor array in the measurement head, comprising providing the magnetic mounting stub with the cutout; coupling the mounting stub to the flow cell with a first magnet; coupling the cantilever sensor array to one of opposed ends of an exchange tool including second and third magnets (19) at each respective end; and positioning the cantilever sensor array adjacent to the cutout, such that the cantilever sensor array is transferred to the cutout; and

(e) a measurement chamber for the cantilever sensor array, comprising the flow cell having a base, an inlet port and an outlet port connected by a flow channel; and the cantilever array having cantilever(s) mounted inside the flow cell. The cutout facilitates alignment of the cantilever sensor in the measurement head. The height and weight of each of the ports are equal to that of the flow channel.

USE - For measuring static and dynamic properties, e.g. deflection, resonant frequency, phase, and amplitude as a function of time in response to various target substances.

ADVANTAGE - The invention accurately detects and measures the presence of target substances in various environmental conditions. It provides very high accuracy frequency measurements in a relatively short time.

L101 ANSWER 105 OF 106 (C) JPO on STN
AN 1996-146015 JAPIO
TI CANTILEVER OF SCANNING TYPE **PROBE MICROSCOPE**
IN YAGI AKIRA
PA OLYMPUS OPTICAL CO LTD
PI JP 08146015 A 19960607 Heisei
AI JP 1994-293125 (JP06293125 Heisei) 19941128
PRAI JP 1994-293125 **19941128**
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1996
IC ICM G01N037-00
ICS G01B021-30; H01J037-28

AB PURPOSE: To trace a **probe** to **measure** the uneven image of a sample and to make it possible to perform the **optical observation** of the sample without moving a **cantilever** by making the free end part of the **cantilever** transparent to **observe** the sample through the free end part. CONSTITUTION: The free end of a **cantilever** is constituted of a **probe** part 1, the visually transparent part in the visible light region in the periphery of the **probe** part 1, that is, the transparent part 2 and a lever part 3. The transparent part 2 is composed of silicon nitride and the lever part 3 consists of a silicon membrane 6 and a piezoelectric resistance layer 12. Both ends on the opening end of the V-shaped pattern of the resistance layer 12 are fixed to a **glass substrate** 4 to be electrically connected to electrodes 5a, 5b. When external force acts on the **cantilever**, the resistance value between the electrodes 5a, 5b is varied by the stress of the resistance layer 12. The value of the current flowing to the resistance layer 12 is varied accompanying this and the force acting on the gap between the **sample** and the **probe** part 1 is **detected** as the variation of a current value. **Optical observation** is executed through the transparent part 2.

L135 ANSWER 99 OF 123 COPYRIGHT THOMSON REUTERS on STN
AN 1997-411556 [38] WPIX
DNN N1997-342752 [38]
TI Cofocal point **scanning** type **microscope** for mask inspection in semiconductor device mfr - establishes thickness of **transparent layer** and focal position of first object **lens** based on detected intensity of focal establishment reflection **light**
DC P81; S02; U11
IN TACHIKAWA S; UKIGUSA H
PA (IHIS-N) IHI SCUBE KK; (ISHI-C) ISHIKAWAJIMA HARIMA HEAVY IND; (ISHI-C) ISHIKAWAJIMA SYSTEM TECHNOLOGY KK
~~CYC 1~~
PI JP 09184706 A 19970715 (199738)* JA 6[3] <--
~~JP 3715013~~ B2 ~~20051109~~ (200574) JA 9
ADT JP 09184706 A JP 1995-344085 19951228; JP 3715013 B2 JP 1995-344085 19951228
FDT JP 3715013 B2 Previous Publ JP 09184706 A
PRAI JP 1995-344085 19951228
IPCR G01B0011-02 [I,A]; G01B0011-02 [I,C]; G01B0009-04 [I,A]; G01B0009-04 [I,C]; G02B0021-00 [I,A]; G02B0021-00 [I,C]; G02B0007-00 [I,A]; G02B0007-00 [I,C]; G02B0007-04 [I,A]; G02B0007-04 [I,C]
AB JP 09184706 A UPAB: 20060201

The microscope includes a **transparent layer** (a14) whose thickness is established according to the thickness of a **glass layer** of a measurement object (A). A first object **lens** (a12) condenses a **measurement** incident **light** to the lower end **surface** of the **glass layer** of the measurement object. A first photodetector (a7) detects intensity of **measurement** reflection **light** from the **measurement** object. The size of an object part formed on the lower end surface of the measurement object is measured based on the detection result of the first photodetector. A second object **lens** (b11) arranged opposing the first object **lens**, on the same optical axis of the first object **lens**, condenses a focal establishment incident light to the lower end **surface** of the **glass layer**. A second photodetector (b6) detects the intensity of focal establishment reflection **light** from the **measurement** object. An **optical** switching unit performs a switching operation such that first object condenses **measurement** incident **light** to the **measurement** object during measurement operation and second object **lens** condenses focal establishment incident **light** to **measurement** object during focal setting of first object **lens**. The thickness of the **transparent layer** is adjusted and the focal position of the first focal **lens** is established based on detected intensity of focal establishment reflection light.

ADVANTAGE - Enables to perform stable instrumentation of measurement object. Eliminates necessity of using separate measurement object thickness measuring device. Enables to establish thickness of **glass layer** of measurement object and focal position of first object **lens** with high precision.